

b) a valve actuator for operating said sampling valve.

2. (Canceled)
3. (Canceled)
4. (Canceled)
5. (Original) The modular oven assembly of claim 1 wherein the column is a capillary column.
6. (Canceled)
7. (Original) The modular oven assembly of claim 1 which is integrated with a valved gas chromatograph by fluidly connecting the outlet of the housing of the oven assembly to the inlet of a detector of the gas chromatograph.
8. (Currently Amended) The modular oven assembly of claim 1 wherein [at least one of] the chromatographic ~~columns of the oven compartment~~ is a column ~~having~~ has a geometry selected to maximize the carrier gas linear velocity and sample capacity without overwhelming the column or detector.
9. (Canceled)
10. (Currently Amended) The modular oven assembly of claim 9 ~~7~~ wherein the gas chromatograph contains both a flame ionization detector and a thermal conductivity detector.

REMARKS

Claims 1, 5, 7, 8, and 10 are left in the application and are under prosecution.

By way of the present communication applicant has canceled claims 2, 3, 4, 6, and 9 in order to claim in invention portrayed in the figure of the present application.

Claim 1 has been amended so that the oven assembly only contains one sampling valve, one sampling loop, one heater, and one column. Claim 1 has also been amended by including a

valve actuator which is operated by air. All of the amendments to claim 1 are shown in the sole figure hereof and no new matter has been added. A discussion of the valve actuator can be found at the bottom of page 9 of the instant specification.

Drawing – Examiner’s Position

The drawings are objected to under 37 CFR 1.83(a) because the Examiner believes that the drawings do not show every feature of the invention specified in the claims. For example, it is the Examiner’s position that the multiport sampling valves, sampling means, and heaters, as recited in claims 1-4, 6, and 10 must be shown or the features canceled from the claims.

Drawing – Applicant’s Position

In view of extensive amendments made to claim 1 and the cancellation of other claims it is applicant’s position that the claims, as now amended, are represented by the figure. Therefore, applicant requests that the Examiner withdraw this objection.

Specification

The specification has been objected to because of various inconsistencies and typographical errors found by the Examiner. All of these have been addressed by applicant in this communication and substitute paragraphs have been currently submitted. Therefore, it is requested that the objections to the Specification be withdrawn.

Claim Objections – Examiner’s Position

Claims 3 and 4 are objected to because of the following informalities:

Claim 3, line 1 contains the phase “that contains” which the Examiner believes is improper. The Examiner would like to see another phase, such as “further comprising” used instead.

Claim 4, line 1 contains the term “to” and should be corrected to read “two”, and the term “column” should be made plural.

Claim Objections – Applicant’s Position

In view of the cancellation of claims 3 and 4 applicant requests that the Examiner withdraw these objections.

Rejections under 35 USC 112.

Examiner’s Position

Claims 1-10 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention.

The Examiner points to the following: Claim 1, line 11 it is unclear if the “first” or “second” housing is referred to. *Applicant has amended claim 1 so that it is now clear what housing is meant.*

The Examiner indicates that the term “said first enclosed compartment” lacks antecedent basis. *Applicant has amended claim 1 by eliminating such term.*

The Examiner also indicates that the terms “the oven compartment”, “the carrier gas linear velocity”, and “the column or detector” lacks antecedent basis.

Applicant’s Position

Applicant has amended claim 1 so that there is now antecedent basis for all terms. Therefore, applicant requests that the Examiner withdraw these rejections.

First Rejection Under 35 USC 103(a)

Examiner’s Position

Claims 1, 2 and 8 have been rejected under 35 USC 103(a) as being unpatentable over US 6,453,725 (Dahlgreen et al.) herein after Dahlgreen, in view of GB 1089642, herein after GB.

It is the Examiner's position that Dahlgreen discloses a gas chromatograph sample and column-switching valve, as shown in Figure 2 and an oven having sample inlets and outlets into the oven, a multiport valve having sample inlets and outlets that correspond to the inlets and outlets through the oven, a fixed volume sampling loop which is integral with the sampling valve; and two chromatograph columns fluidly connected to the sampling valve. The Examiner also notes that Dahlgreen teaches the use of a multi-celled detector to detect the various constituents separated in the columns. The Examiner further notes that although not shown in Dahlgreen, a heater and an actuating mechanism associated with the sampling valve would be inherent to the functionality of the presently claimed invention since a heater is needed for the oven, and some actuating means is necessary to allow the multi-port valve to perform its sampling function. The Examiner also notes that Dahlgreen fails to show placement of the oven within an exterior housing.

GB is cited as disclosing an apparatus used in gas chromatography comprising a furnace holding a multi-port sampling block, a sampling volume integral with the sampling block, and two columns. The furnace is located within an outer casing and a heating system is provided within the spacing between the casing and the furnace. The Examiner contends that it would have been obvious to one having ordinary skill in the art to provide an outer casing for an oven as a means of controlling temperature of the apparatus, as well as provided extra protection.

With respect to claim 2, the Examiner argues that Dahlgreen fails to disclose a column train, but that GB teaches a second column in series with a first column.

With respect to claim 8, the Examiner argues that the limitation on the particular type of column is an obvious choice of design for one having ordinary skill in the art as a way of maximizing the efficiency of the analyzer.

Applicant's Position

The presently claimed invention is not directed to a gas chromatograph. The presently claimed invention is an oven assembly comprising a single sampling valve, a single column, a

single sampling loop, a single heater, and a single valve actuator. There is no detector device associated with the oven assembly as claimed in claim 1. The oven assembly of the present invention is a stand alone article of manufacture and can be assembled separately and sold to users of gas chromatographs that merely need to connect the transfer line from the column to an inlet line of the gas chromatograph. None of the art cited by the Examiner relates to a modular oven assembly. For example, Dahlgreen teaches a complex sampling valve that becomes an integral part of a gas chromatograph. There is no mention of a stand alone oven assembly in Dahlgreen. GB relates to a chromatograph having various chromatograph elements formed and/or mounted in recesses in a single homogenous block, which elements are brought into operative association with the aid of passages within the block. Again, as with the Dahlgreen teaching, there is no suggestion of a single stand alone oven assembly that does not contain a detector.

Therefore, it is applicant's position that the teaching of Dahlgreen in view of GB does not suggest, nor make obvious, the instant invention as now claimed. Consequently, applicant requests that the Examiner reconsider and withdraw this rejection.

Second Rejection Under 35 USC 103(a)

Examiner's Position

Claim 3 has been rejected under 35 USC 103(a) as being unpatentable over Dahlgreen, in view of GB, as applied to claim 1 above, and further in view of US 6,474,136, hereinafter Nishina.

Dahlgreen and GB have been discussed in length by the Examiner in his First Rejection under 35 USC 103(a). Nishina is cited as disclosing an apparatus for analyzing impurity components comprising two sampling valves and two columns. The Examiner contends that providing two sampling valves would have been obvious to one of ordinary skill in the art as a means of allowing more samples to be analyzed more effectively than sampling through a single multi-port valve.

Applicant's Position

In view of the cancellation of claim 3 applicant requests that this rejection be withdrawn.

Third Rejection Under 35 USC 103(a).

Examiner's Position

Claim 4 has been rejected under 35 USC 103(a) as being unpatentable over Dahlgreen, in view of GB as applied to claim 1, and further in view of US 6,227,035 hereinafter Trochesset.

Trochesset is cited as teaching an integrated valve design for a gas chromatograph wherein the chromatograph is provided with a multi-port sampling valve, a sampling loop integral with the sampling valve, and two chromatograph columns, which may be parallel to each other. The Examiner contends that providing columns that are in parallel with each other would have been obvious to one of ordinary skill in the art as a means of increasing the speed of analysis than can be achieved through serial analysis.

Applicant's Position

In view of the cancellation of claim 4 applicant requests that this rejection be withdrawn.

Fourth Rejection Under 35 USC 103(a).

Examiner's Position

Claims 5,7, and 9 have been rejected under 35 USC 103(a) as being unpatentable over Dahlgreen, in view of GB, as applied to claim 1 above, and further in view of US 5,338,514 hereinafter Morabito.

Morabito is cited as disclosing a vented capillary gas chromatograph apparatus comprising an oven, a multi-port sampling valve, a capillary column, and a detector mounted outside of the oven. The Examiner contends that providing a capillary gas chromatograph column would have

been obvious to one of ordinary skill in the art because capillary columns are well known in the art in separate constituents.

Applicant's Position

It is applicant's position that the primary references, Dahlgreen and GB fail to suggest an oven assembly as instantly claimed and that Morabito is cited as teaching capillary columns. Therefore, applicant requests that this rejection also be withdrawn.

Fifth Rejection Under 35 USC 103(a).

Examiner's Position

Claim 6 has been rejected under 35 USC 103(a) as being unpatentable over Dahlgreen, in view of GB as applied to claim 1, and further in view of Trochesset and Morabito.

The Examiner believes that Dahlgreen and GB both disclose the use of two columns, however, the Examiner notes that each reference fails to expressly state that the columns can be configured in parallel with each other. The Examiner states that Trochesset discloses an integrated valve design for a gas chromatograph wherein the gas chromatograph is provided with a multi-port sampling valve, a sampling loop integral with the sampling valve, and two chromatograph columns, which may be configured in parallel. The Examiner contends that providing columns in parallel with each other would have been obvious to one having ordinary skill in the art as a means for increasing the speed of analysis than can be achieved through serial analysis. Morabito is cited as disclosing a vented capillary column and a detector mounted outside of the oven. The Examiner contends that it would have been obvious to provide a capillary gas chromatograph column because capillary columns are well known in the art to separate constituents.

Applicant's Position

In view of the cancellation of claim 6 applicant requests that this rejection be withdrawn.

Sixth Rejection Under 35 USC 103(a).

Examiner's Position

Claim 10 has been rejected under 35 USC 103(a) as being unpatentable over Dahlgreen, in view of GB as applied to claims 1 and 7 above, and further in view of Marabito, Trochesset, US 5,049,509 hereinafter Szakasits, and US 5,435,169 hereinafter Mitra.

Szakasits is cited as disclosing a chromatographic analyzer comprising a multi-port sampling valve, a sample loop, multiple columns, and multiple flame ionization detectors. Mitra is cited as disclosing a device for monitoring volatile organic compounds comprising a multi-port valve, a sampling loop, a column, and a detector. The Examiner contends that providing a chromatograph utilizing different detectors would have been obvious to one of ordinary skill in the art as a means of maximizing accuracy of detection by allowing one of ordinary skill in the art to take advantage of the benefits of utilizing one detector over another in combination with the benefits provided by utilizing a second, and different detector.

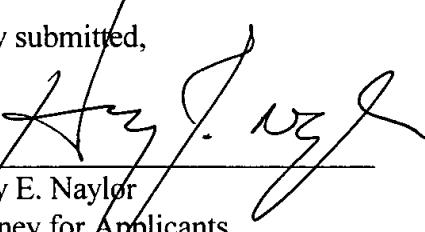
Applicant's Position

Applicant is no longer claiming multiple sampling valves, columns etc. It is applicant's position that the modular oven assembly is novel and unobvious over the cited art and as such, its' connection of a gas chromatograph would also be patentable. Therefore, applicant again requests that the Examiner reconsider and withdraw this rejection.

Applicant's attorney notes that other art has been made of record, but has not been cited against the claims.

In view of the above, it is applicants' position that the claims, as now amended, define a patentable invention over the art. Therefore, applicants request that the Examiner pass this application to allowance.

Respectfully submitted,

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